

REMARKS

In the Office Action of February 18, 2004, the examiner rejected claims 1, 6, 10, 12 and 15 under 35 USC §103(a) as being unpatentable over the Werb et al U.S. Patent No. 6,150,921, in view of the Zai U.S. Patent No. 6,122,329. By the present amendment, independent claims 1 and 15 have been amended to more particularly define and claim the invention such that claims 1 and 15 are believed to be allowable over the combination of references cited by the examiner.

In the Office Action, the examiner stated that the Werb '921 patent taught all of the features required by independent claim 1 except for the wireless transmission between the beacon and the receiver. For this feature of the invention, the examiner cited the Zai '329 reference.

By the present amendment, independent claim 1 has been amended to more particularly define the transmissions taking place between the beacons, transponders and the receiver in the system of claim 1. As amended, each of the beacons in the system of claim 1 originally transmits a wireless interrogation signal during the time slots of a TDMA frame. The interrogation signals transmitted by each of the beacons are received by the transponders that are currently in range of the beacon. As required by claim 1, each of the transponders generates a transponder response that is a frequency shifted version of the interrogation signal. As required by independent claim 1, the transponder generates the transponder responses only during the pre-determined transponder time slot of the TDMA frame.

As described in the specification of the present application, each of the transponders is a low cost, simple device that, upon receiving the interrogation signal, frequency shifts the interrogation signal and transmits the frequency shifted version back to the beacon that originally generated the interrogation signal. Since more than one transponder may respond to the interrogation signal generated by each of the beacons, claim 1 clearly indicates that each of the transponders responds to the interrogation signal only during the pre-determined transponder time slot of the TDMA frame. When each of

① the transponders are placed into the system, each of the transponders is assigned a different transponder time slot of the TDMA frame. Thus, multiple transponders can respond at the same frequency without the response signals colliding and interfering with each other.

In general, this feature of claim 1 was originally included in claim 2, which has now been cancelled. In rejecting claim 2, the Examiner stated that the Doany U.S. Patent No. 6,377,203 taught responses in multiple time frames.

After reviewing the Doany '203 patent, the applicant disagrees with such finding by the Examiner. The Doany '203 patent utilizes multiple communication channels to sort responses from various radio frequency ID (RFID) tags. The Doany '203 patent does not teach or suggest, nor render obvious, the use of transponder time slots within a larger TDMA frame such that each of the individual transponders can respond only during a pre-determined portion of the TDMA time frame to avoid overlapping of the responses from multiple transponders.

In the Doany '203 patent, the locator or reader receives multiple signals (1-4) on a primary communications channel 21, as shown in Figure 2 and described in column 4, lines 40-47. As the Doany '203 patent indicates, for each of the RFID tags that can be identified, the RFID tags are assigned to a particular channel for further communications. If several of the RFID tags cannot be identified, the RFID tag is commanded to transmit another response which is delayed from the primary communication channel. Thus, all of the RFID tags, which correspond to the transponders of claim 1, initially generates a response at the same time and the receiver must determine the RFID tag responses that can be interpreted. If the RFID tag response cannot be interpreted, the RFID tag is requested to issue another response, which inherently must be delayed from the initial response.

The Doany '203 patent does not teach or suggest, nor render obvious, the assignment of a transponder time slot for each of the plurality of transponders before the transponders are placed into the system such that the transponders respond at different

times during the TDMA frame. Since this feature is not taught or suggest, nor rendered obvious by any of the references cited by the examiner, independent claim 1 is believed to be in condition for allowance.

By the present amendment, independent claim 1 has also been amended to indicate that the receiver is configured to receive a retransmitted interrogation signal and a retransmitted, received transponder response from each of the beacons such that the receiver can then determine the distance between the beacon and the transponder based upon the time difference between the retransmitted interrogation signal and the retransmitted transponder response from the beacon. The receiver is also able to identify the transponder based on the timing of the transponder response within the TDMA frame.

The Werb '921 patent cited by the examiner simply teaches the transmission of an interrogation signal from an antenna and detecting the amount of time required for a remote tag to respond to such interrogation signal. The Werb '921 patent teaches the use of multiple antennas that each transmit their own interrogation signal and utilizing the distance measured from each of the multiple antennas to provide multiple distance measurements. Based on these distance measurements, the triangulation technique can be used to determine the position a tag.

As required by independent claim 1, the system includes a receiver that is coupled to a computer system as well as receives retransmitted interrogation signals and transponder responses from at least one beacon. The receiver itself does not transmit signals to the transponders, but instead responds only to the retransmitted signal from the beacons. In this manner, the signal receiver can communicate with multiple beacons such that only the single receiver needs the required circuitry to calculate the distance between the beacon and one of the transponders.

In the Werb '921 patent, each of the antennas must both generate the interrogation signal and perform the distance calculations. Thus, each of the antennas must include the required circuitry to perform distance calculations.

Based upon the above distinctions, independent claim 1 is believed to be allowable over the references cited by the examiner.

Claims 3-9, 11 and 13-14 depend directly or indirectly from claim 1 and are believed to be allowable based upon the above arguments for allowance, as well as in view of the subject matter of each claim.

As discussed above, the Examiner also rejected independent claim 15 based upon the Werb '921 patent in view of the Zai '329 patent. By the present amendment, independent claim 15 has been amended to more specifically define over the combination of references cited by the Examiner and, as such, independent claim 15 is believed to be in condition for allowance.

By the present amendment, claim 15 has been amended to more particularly state that the interrogation signal is sent by wireless communications from the beacon to the transponder during a TDMA time slot assigned to the beacon. Upon receiving the interrogation signal, the transponder returns a response signal only during a pre-determined transponder time slot that is defined as a portion of the TDMA time slot.

This feature of claim 15 was originally included in claim 21, which has now been cancelled. In rejecting claim 21, the examiner stated that that Doany '203 patent taught the transmission of signals from ID tags during different portions of a TDMA time slot. As discussed above in the arguments for allowance of independent claim 1, the Doany '203 patent does not teach or suggest, nor render obvious, the allocation of transponder time slots within a larger TDMA timeslot before the transponder is paced into the system to avoid multiple RF signals colliding during transmission back to a beacon. Instead, the Doany '203 teaches that multiple signals can be interpreted and understood at the same time and, if some of the received signals cannot be interpreted, the RFID tags are instructed to transmit signals on different channels. However, the Doany '203 patent does not teach or suggest, nor render obvious, the pre-assignment of a transponder time slot for each transponder where each time slot is a portion of a larger TDMA time slot. As required by independent claim 1, the transponder is able to respond only during the

pre-determined transponder time slot to prevent the collision of multiple response signals from multiple transponders. For this reason, independent claim 15 is believed to be allowable over the combination of references cited by the examiner.

Additionally, claim 15 has been amended to indicate that each of the beacons retransmits the interrogation signal to the receiver within a retransmission frequency band separate from the interrogation frequency band. Additionally, each of the beacons, upon receiving the response signal from one of the transponders, transmits by wireless communications the response signal within the retransmission frequency band that is separate from the interrogation frequency band. In this manner, the beacon can separately communicate with each of the transponders and receivers by utilizing the interrogation frequency band to communicate with the transponders and a separate, retransmission frequency band to communicate with the receiver. The use of multiple frequency bands by the single beacon allows the beacon to carry out separate communications without either of the communications interfering with each other. This feature of claim 15 was originally included in claim 18, which has now been cancelled.

In rejecting original claim 18, the Examiner stated that the D'Hont U.S. Patent No. 5,453,747 taught operating an interrogator with different frequency channels for communication. Although the D'Hont '747 patent teaches an interrogator that communicates over a low frequency channel and a high frequency channel, the patent does not teach or suggest, nor render obvious a beacon that receives a signal from a transponder and retransmits the signal from the transponder at a different frequency to a receiver such that the receiver can calculate a time difference between the original interrogation signal and the response signal, as required by claim 15.

Since this feature is not taught or suggested, nor rendered obvious by the references cited by the examiner, independent claim 15 is believed to be in condition for allowance and such action is respectfully requested.

Claims 16, 19-20 and 22 depend directly or indirectly from claim 15 and are believed to be allowable based upon the arguments for allowance, as well as in view of the subject matter of each claim.

In rejecting independent claim 23, the Examiner relied upon the combination of Gaisser et al U.S. Patent No. 6,104,295 in view of the Werb '921 patent.

By the present amendment, claim 23 has been amended to require the transponder module to sense an identifier of the disposable wrist band upon attachment to the wrist band such that the identifier determines the timing of the response of the transponder module to the interrogation signal. Thus, when the transponder module is initially attached to the disposable wrist band, the identifier of the disposable wrist band affects the way the transponder module generates a response signal upon receiving the interrogation signal.

In the Office Action, the Examiner stated that the Gaisser '295 reference taught a disposable wrist band, but did not teach a transponder module that is adapted to be releasably attached to the disposable wrist band. It was the Examiner's opinion that it would have been obvious to one of ordinary skill in the art to have a transponder module that is releasably attachable to a disposable wrist band.

By the present amendment, claim 23 has been amended to indicate that the disposable wrist band includes an identifier such that the transponder module can sense the identifier and modify its operation based upon the identifier. In this manner, the disposable wrist band can be created including the unique identifier such that upon the transponder module being attached to the wrist band, the module operates in a known and desired manner.

In the Gaisser '295 reference cited by the examiner, the transponder module is integrally formed as part of the disposable wrist band. Thus, the transponder module, and specifically the microprocessor 46, is permanently installed onto the wrist band and does not need to read any identifier information contained on the wrist band. Since the microprocessor will never be removed from the wrist band, there is no teaching or

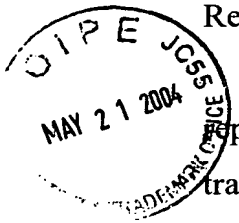
suggestion of having the microprocessor read or respond to an identifier from the disposable wrist band and modify the operation of the module based upon the identification information, as is required by independent claim 23. Accordingly, Gaisser '295 alone or in combination with the Werb '921 patent does not teach or suggest a transponder module that is releasably attached to a disposable wrist band and reads identification information from the wrist band.

Claims 24, 25 and 27-34 depend directly or indirectly from claim 23 and are believed to be allowable based upon the above arguments, as well as in view of the subject matter of each claim.

In the Office Action, claim 35 was also rejected based upon the combination of the Gaisser '295 patent in view of the Werb '921 patent. Claim 35 also requires the wrist band portion to include an identifier portion including an identifier that is readable by the transponder module upon insertion of the transponder module into the base such that the operation of the transponder module is at least in part dictated by the identifier portion. As discussed above in the arguments for allowance of independent claim 23, neither the Gaisser '295 or the Werb '921 patent teach or suggest, nor render obvious, the removable attachment of a transponder module to the housing such that the transponder module can be removed and reused by an additional patient. Further, neither of the references cited by the examiner teach or suggest an identifier portion that is read by the transponder module when the transponder module is inserted into the base such that the identifier portion modifies the operation of the transponder module.

The use of the identifier portion allows the transponder module to be inserted into the base portion such that the identifier included in the identifier portion at least in part dictates the operation of the transponder module without any additional steps or information required from the user. This feature of independent claim 35 allows the transponder module to be transferred between different patients without requiring anything additional other than a separate base portion to be assigned to the patient. Since disposable wrist band includes the identifier, the transmitter module does not need to be

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reprogrammed or any additional information entered other than simply to attach the transponder module to the disposable wrist band. Clearly, this feature of claim 35 is not taught or suggested, nor rendered obvious, by any of the references cited by the examiner.

Claims 36-39 depend directly or indirectly from claim 35 and are believed to be allowable based upon the above arguments for allowance, as well as via the subject matter of each claim.

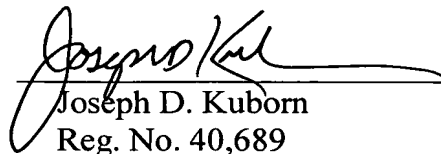
By the present amendment, allowable claim 17 has been rewritten into independent form and is believed to be in condition for allowance.

Based upon the above amendment and the foregoing arguments for allowance, claims 1, 3-9, 11, 13-17, 19-20, 22-25 and 27-39 are believed to in condition for allowance. The examining attorney is invited to contact the applicant's undersigned attorney with any questions or comments, or to otherwise facilitate prosecution of the present application.

Respectfully submitted,

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